

## What is Claimed:

1                   1.     A circuit for applying a transfer function to an input signal comprising:  
2                   an input line for receiving the input signal;  
3                   a plurality of operators for generating piecewise-linear segments of the  
4                   transfer function; and

5                   a window detector for determining a value of the input signal and selecting one  
6                   of the operators based on the value of the input signal;

7                   wherein the selected one of the operators applies a correction value to correct  
8                   the value of the input signal.

1                   2.     The circuit of claim 1 wherein the selected operator generates the  
2                   piecewise-linear segment free of a table for defining the piecewise-linear segments of the  
3                   transfer function.

1                   3.     The circuit of claim 1 wherein each of the operators generates a  
2                   different one of the piecewise-linear segments of the transfer function.

1                   4.     The circuit of claim 3 wherein each of the operators simultaneously  
2                   generates a respective correction value responsive to the value of the input signal; and

3                   the circuit further including a multiplexer for selecting one of the respective  
4                   correction values to correct the value of the input signal.

1                   5.     The circuit of claim 4 wherein the window detector includes a plurality  
2                   of digital comparators and an encoder for selecting the one respective correction value to  
3                   correct the value of the input signal.

1                   6.     The circuit of claim 1 wherein the selected operator includes a  
2                   multiplier for multiplying the value of the input signal with a value of a slope of the  
3                   piecewise-linear segment generated by the selected operator.

1           7.     The circuit of claim 1 wherein the selected operator includes a  
2 subtractor, a multiplier and an adder;

3                 the subtractor subtracting a lower value of the piecewise-linear segment,  
4 generated by the selected operator, from the value of the input signal to provide an offset  
5 value;

6                 the multiplier multiplying the offset value with a value of a slope of the  
7 piecewise-linear segment to provide a product; and

8                 the adder adding the product and a low output value of the piecewise-linear  
9 segment to provide the correction value.

1           8.     The circuit of claim 1 wherein the input signal is a video signal and the  
2 transfer function is an inverse gamma transfer function.

1           9.     A gamma correction circuit for applying an inverse gamma transfer  
2 function to an input video signal, the circuit comprising:

3                 an input line for receiving the input video signal;

4                 a plurality of operators for generating piecewise-linear segments of the inverse  
5 gamma transfer function; and

6                 a window detector for determining a value of the input video signal and  
7 selecting one of the operators based on the value of the input video signal;

8                 wherein the selected one of the operators applies a correction value to correct  
9 the value of the input video signal.

1           10.    The circuit of claim 9 wherein the selected operator generates the  
2 piecewise-linear segment free of a table for defining the piecewise-linear segments of the  
3 inverse gamma transfer function.

1           11.    The circuit of claim 9 wherein each of the operators generates a  
2   respectively different one of the piecewise-linear segments of the inverse gamma transfer  
3   function.

1           12.    The circuit of claim 11 wherein each of the operators simultaneously  
2   generates a respective correction value responsive to the value of the input signal; and

3                   the circuit further including a multiplexer for selecting one of the respective  
4   correction values to correct the value of the input video signal.

1           13.    The circuit of claim 12 wherein the window detector includes a  
2   plurality of digital comparators and an encoder for selecting the one respective correction  
3   value to correct the value of the input video signal.

1           14.    The circuit of claim 9 wherein the operator includes a multiplier for  
2   multiplying the value of the input video signal with a value of a slope of the piecewise-linear  
3   segment generated by the selected operator.

1           15.    The circuit of claim 9 wherein the operator includes a subtractor, a  
2   multiplier and an adder;

3                   the subtractor subtracting a lower value of the piecewise-linear segment,  
4   generated by the selected operator, from the value of the input video signal to provide an  
5   offset value;

6                   the multiplier multiplying the offset value with a value of a slope of the  
7   piecewise-linear segment to provide a product; and

8                   the adder adding the product and a low output value of the piecewise-linear  
9   segment to provide the correction value.